DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1.   A request for continued examination under 37 CFR 1.114, including the fee set

forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this

application is eligible for continued examination under 37 CFR 1.114, and the fee set

forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action

has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on

12/23/09 has been entered.

Response to Arguments

2.   Applicant's arguments with respect to claims 1, 3- 24, and 26 - 29 have been

considered but are moot in view of the new ground(s) of rejection.

        Applicant argues that Lekutai does not teach a modifier and a modified word; a

word division unit operable to divide the recognition object into the constituent words;

and a syllable string generation unit operable to generate syllable strings of each

constituent word in the constituent words based on readings of the recognition object,

wherein said abbreviated word generating unit is operable to generate the abbreviated

word including one ore more syllables by extracting one or more syllables from the

syllables strings of the constituent words and concatenating the extracted one or more

syllables based on the syllables strings of the constituent words generated by said

syllables string generation unit (Amendment, pages 11- 13).

Claim Rejections - 35 USC § 103

3.　　　Claims 1, 3 – 23, 26, 27, and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lekutai (US PAP 2005/0240391) in view of Mikizo (JP 3-194653), and further in view of Hiroyuri et al., (JP 2002-041081).

As per claim 1, Lekutai teach a speech recognition dictionary creation device for creating a speech recognition dictionary, said device comprising:

an abbreviated word generation unit operable to generate an abbreviated word of a recognition object that constituent words, based on a generation rule, out of candidates including the abbreviated word of the recognition object generated by concatenating: the constituent words into which the recognition object is divided and which are not adjacent each other, and parts of the constituent words into which the recognition object is divided (**"the abbreviated text string is produced based on the abbreviation library…"** paragraph 5; paragraph 29, lines 1 – 6);

a vocabulary storage unit which stores, as the speech recognition dictionary, the generated abbreviated word together with the recognition object (**"a memory configured to store an abbreviation library, wherein the abbreviated text string is produced based on the abbreviation library"** (paragraph 5).

However, Lekutai does not specifically teach a modifier and a modified word; an utterance probability of the abbreviated word based on either the generated rule or ease of pronunciation of the abbreviated word; a word division unit operable to divide the

recognition object into the constituent words; and a syllable string generation unit

operable to generate syllable strings of each constituent word in the constituent words

based on readings of the recognition object, wherein said abbreviated word generating

unit is operable to generate the abbreviated word including one ore more syllables by

extracting one or more syllables from the syllables strings of the constituent words and

concatenating the extracted one or more syllables based on the syllables strings of the

constituent words generated by said syllables string generation unit.

Hiroyuri et al., teach that **utterance probability computed by having used at
least one of analysis likelihood, reading likelihood**...and the key word dictionary

collated results for a recognized vocabulary which becomes in each above-mentioned

utterance unit is given and registered into the above-mentioned lexical memory

measure" (paragraph 16).

Therefore, it would have been obvious to one of ordinary skill in the art the time

the invention was made to generate abbreviated words based on different candidates

as taught by Hiroyuri et al., in Lekutai, because that would help correctly recognize

partial character strings uttered by users (Hiroyuri et al., paragraph 14).

Lekutai in view Hiroyuri et al., do not specifically that a modifier and a modified

word; a word division unit operable to divide the recognition object into the constituent

words; and a syllable string generation unit operable to generate syllable strings of each

constituent word in the constituent words based on readings of the recognition object,

wherein said abbreviated word generating unit is operable to generate the abbreviated

word including one ore more syllables by extracting one or more syllables from the

syllables strings of the constituent words and concatenating the extracted one or more

syllables based on the syllables strings of the constituent words generated by said

syllables string generation unit.

Mikizo discloses generating and registering a character index as to respective

characters included in data and a phrase index as to a direct phrase consisting of two

continuous characters and an indirect phrase consisting of two characters, which is

combined by abbreviating one or two sandwiched words and which are combined.

Consequently, 'TO GAI', 'GAI GO', and 'GAI DAI' are automatically registered in the

phrase index as the KANJI (Chinese character) abbreviated words of Tokyo Gaikokugo

Daigaku (Mikizo; Abstract).

Therefore, it would have been obvious to one of ordinary skill in the art the time

the invention was made to generate abbreviated words based on syllable strings of the

constituent words as taught by Mikizo in Hiroyuri et al., in view of Lekutai, because that

would help correctly recognize partial character strings uttered by users (Hiroyuri et al.,

paragraph 14).

As per claim 3, Lekutai in view of Hiroyuri, and further in view of Mikizo further

discloses that said abbreviated word generation unit includes: an abbreviated word

generation rule storage unit operable to hold a generation rule for generating an

abbreviated word using moras; and an abbreviated word determination unit operable to

determine an abbreviated word for final generation, by applying the generation rule held

by said abbreviated word generation rule storage unit (Lekutai; "a memory configured to store an abbreviation library.. rule library"; paragraph 5).

a candidate generation unit operable to generate candidate abbreviated words, each including one or more syllables, by extracting one or more syllables from the syllable strings of the respective constituent words and concatenating the extracted one or more syllables (Mikizo; Abstract "'TO GAI', 'GAI GO', and 'GAI DAI' are automatically registered in the phrase index as the KANJI (Chinese character) abbreviated words of Tokyo Gaikokugo Daigaku"; Hiroyuri; paragraph 13, lines 1- 7, paragraph 15.

As per claim 4, Lekutai in view of Hiroyuri et al., further in view of Mikizo further disclose wherein said abbreviated word generation rule storage unit is operable to hold a plurality of generation rules (Lekutai; paragraph 5);

said abbreviated word determination unit is operable to calculate a likelihood under each of the generation rules stored in said abbreviated word generation rule storage unit and to determine an utterance probability by comprehensively taking into account the calculated likelihoods, the utterance probability being determined for each of the generated candidate abbreviated words, and said vocabulary storage unit is operable to store the abbreviated word and the utterance probability that are determined by said abbreviated word determination unit (Hiroyuri et al., "likelihood showing a probability"; paragraph 15).

As per claim 5, Lekutai in view of Hiroyuri et al., further in view of Mikizo further

disclose that said abbreviated word determination unit is operable to determine the

utterance probability by summing up values that are obtained by multiplying the

likelihoods for the generation rules by corresponding weighting factors (see equation 6;

Hiroyuri et al., paragraph 91).

As per claim 6, Lekutai in view of Hiroyuri et al., further in view of Mikizo further

disclose that said abbreviated word determination unit is operable to determine that a

candidate abbreviated word is the abbreviated word for final generation in the case

where the utterance probability of the candidate abbreviated word exceeds a

predetermined threshold ("predetermined value"; Hiroyuri et al., paragraph 100).

As per claim 7, Lekutai in view of Hiroyuri et al., further in view of Mikizo further

disclose said abbreviated word generation rule storage unit is 10 operable to hold a first

rule concerning dependency relationship between words, and

said abbreviated word determination unit is operable to determine, based on the first

rule, the abbreviated word for final generation from among the candidates ("vocabulary

which presents the score beyond a higher rank predetermined value"; Hiroyuri et al.,

paragraph 100).

As per claim 8, Lekutai in view of Hiroyuri et al., further in view of Mikizo further

disclose the first rule includes a condition that an abbreviated word should be generated

using a modifier and a modified word as a pair ("message text is abbreviated based on
an abbreviation library"; Lekutai; paragraph 10).

As per claim 9, Lekutai in view of Hiroyuri et al., further in view of Mikizo further
disclose the first rule includes a rule indicating a relationship between the likelihood and
a distance between a modifier and a modified word that make up an abbreviated word
("analysis of likelihood which expresses the degree of a probability to all the division
candidates"; Hiroyuri et al., paragraph 58).

As per claim 10, Lekutai in view of Hiroyuri et al., further in view of Mikizo further
suggest said abbreviated word generation rule storage unit is operable to hold a second
rule that is related to at least one of a length of a partial syllable string and a position of
the partial syllable string, the length being a length of the partial syllable string that is
extracted from a mora string of the constituent word when an abbreviated word is
generated, and the position being a position of the partial syllable string in the
constituent word, and said abbreviated word determination unit is operable to
determine, based on the second rule, the abbreviated word for final generation from
among the candidates ("text length is shortened based on stored rules; Lekutai;
Abstract; Mikizo, Abstract, "'TO GAI', 'GAI GO', and 'GAI DAI' are automatically
registered in the phrase index as the KANJI (Chinese character) abbreviated words of
Tokyo Gaikokugo Daigaku").

As per claim 11, Lekutai in view of Hiroyuri et al., further in view of Mikizo further suggest said second rule includes a rule indicating a relationship between the likelihood and a number of syllables indicating the length of the partial syllable string ("analysis of likelihood which expresses the degree of a probability to all the division candidates"; Hiroyuri et al., paragraph 58; Mikizo, Abstract).

As per claim 12, Lekutai in view of Hiroyuri et al., further in view of Mikizo further suggest that said second rule includes a rule indicating a relationship between the likelihood and a number of syllables indicating a distance from a top of the constituent word to the partial syllable string, the distance indicating the position of the partial syllables string in the constituent word ("analysis of likelihood which expresses the degree of a probability to all the division candidates"; Hiroyuri et al., paragraphs 58, and 15; Mikizo, Abstract).

As per claim 13, Lekutai in view of Hiroyuri et al., further in view of Mikizo further suggest that said abbreviated word generation rule storage unit is operable to hold a third rule related to concatenated partial syllable strings that make up an abbreviated word, and said abbreviated word determination unit is operable to determine, based on the third rule, the abbreviated word for final generation from among the candidates ("text length is shortened based on stored rules; Lekutai; Abstract; Mikizo, Abstract).

As per claim 14, Lekutai in view of Hiroyuri et al., further in view of Mikizo further suggest wherein the third rule includes a rule indicating a relationship between the likelihood and a combination of a last syllable and a top syllable, the last syllable being included in a former of the concatenated two partial syllable strings and the top syllable being included in a latter of the concatenated two partial syllable strings ("analysis of likelihood which expresses the degree of a probability to all the division candidates"; Hiroyuri et al., paragraphs 58, and 15; Mikizo, Abstract; "'TO GAI', 'GAI GO', and 'GAI DAI' are automatically registered in the phrase index as the KANJI (Chinese character) abbreviated words of Tokyo Gaikokugo Daigaku").

As per claim 15, Lekutai in view of Hiroyuri et al., further in view of Mikizo further discloses an extraction condition storage unit operable to store a condition for extracting the recognition object from character string information that includes the recognition object (Lekutai; "speech recognition …before or after transmission"; paragraph 31);

a character string information obtainment unit operable to obtain the character string information that includes the recognition object; and a recognition object extraction unit operable to extract the recognition object from the character string information obtained by said character string information obtainment unit according to the condition held by said extraction condition storage unit, and to send to the extracted recognition object to said word division unit (Lekutai; "voice messages can be similarly processed… speech recognition …before or after transmission"; paragraphs 28, and 31, lines 1 – 6).

As per claims 16, 23, Lekutai in view of Hiroyuri et al., further in view of Mikizo further discloses recognizing an input speech by comparing the input speech with a model corresponding to a vocabulary registered in a speech recognition dictionary, said device comprising a recognition unit operable to recognize the speech using the speech recognition dictionary created by the speech recognition dictionary creation device (Hiroyuri et al., "the frequency of reading to each recognition sentence candidate likelihood which generates a recognition sentence candidate and is calculated from a language model using the extracted feature parameter. And the recognition result has been obtained based on this language likelihood"; paragraph 3, last five lines).

As per claim 17, Lekutai in view of Hiroyuri et al., further in view of Mikizo further suggest that the abbreviated word and the utterance probability of the abbreviated word are registered into the speech recognition dictionary together with the recognition object, and said recognition unit is operable to recognize the speech by taking into account the utterance probability registered in the speech recognition dictionary ("analysis of likelihood which expresses the degree of a probability to all the division candidates"; Hiroyuri et al., paragraph 58).

As per claim 18, Lekutai in view of Hiroyuri et al., further in view of Mikizo further suggest that said recognition unit is operable (i) to generate a candidate for a recognition result of the speech and a likelihood of the candidate, (ii) to add a likelihood

corresponding to the utterance probability to the generated likelihood, and (iii) to output the candidate as a final recognition result based on the resulting addition value ("vocabulary which presents the score beyond a higher rank predetermined value"; Hiroyuri et al., paragraphs 99, and 100).

As per claim 19, Lekutai in view of Hiroyuri et al., further in view of Mikizo further suggest an abbreviated word use history storage unit operable to hold ("word frequency of occurrence"), as use history information, an abbreviated word recognized for the speech and a recognition object corresponding to the abbreviated word; and an abbreviated word generation control unit operable to control generation of an abbreviated word by the abbreviated word generation unit based on the use history information held by said abbreviated word use history storage unit (Hiroyuri et al., paragraph 16, lines 1 – 8; Mikizo, Abstract).

As per claim 20, Lekutai in view of Hiroyuri et al., further in view of Mikizo further suggest the abbreviated word generation unit of the speech recognition dictionary creation device includes: an abbreviated word generation rule storage unit operable to hold a generation rule for generating an abbreviated word using syllables; a candidate generation unit operable to generate candidate abbreviated words, each being made up of one or more syllables, by extracting one or more syllables from the syllable strings of the respective constituent words and concatenating the extracted syllables ("analysis of likelihood which expresses the degree of a probability to all the division candidates";

Hiroyuri et al., paragraph 58; paragraph 16, lines 1 – 8; Mikizo, Abstract"'TO GAI', 'GAI

GO', and 'GAI DAI' are automatically registered in the phrase index as the KANJI

(Chinese character) abbreviated words of Tokyo Gaikokugo Daigaku");and

an abbreviated word determination unit operable to determine an abbreviated

word for final generation, by applying the generation rule held by said abbreviated word

generation rule storage unit to the generated candidate abbreviated word, and said

abbreviated word generation control unit is operable to control the generation of the

abbreviated word by making one of change, deletion, and addition to the generation rule

held by the abbreviated word generation rule storage unit (Lekutai; see the abbreviated

example"; paragraph 29, lines 1 – 6).

As per claim 21, Lekutai in view of Hiroyuri et al., further in view of Mikizo further

suggest an abbreviated word use history storage unit operable to hold, as use history

information ("word frequency of occurrence"), an abbreviated word recognized for the

speech and a recognition object corresponding to the abbreviated word; and a

dictionary revision unit operable to revise the abbreviated word stored in the speech

recognition dictionary based on the use history information held by said abbreviated

word use history storage unit (; Hiroyuri et al., paragraph 16, lines 1 – 8; Mikizo,

Abstract).

As per claim 22, Lekutai in view of Hiroyuri et al., further in view of Mikizo further

suggest that the abbreviated word and the utterance probability of the abbreviated word

are registered into the speech recognition dictionary together with the recognition

object, and said dictionary update unit is operable to revise the abbreviated word by

changing the utterance probability of the abbreviated word ("changing condition of the

utterance probability"; Hiroyuri et al., paragraph 124).

As per claims 26, 27, and 29, Lekutai in view of Mikizo do not specifically teach

recognizing an input speech by comparing the input speech with a model

corresponding to a vocabulary registered in a speech recognition dictionary, said device

comprising a recognition unit operable to recognize the speech using the speech

recognition dictionary created by the speech recognition dictionary creation device.

Hiroyuri et al., teach the frequency of reading to each recognition sentence

candidate likelihood which generates a recognition sentence candidate and is

calculated from a language model using the extracted feature parameter. And the

recognition result has been obtained based on this language likelihood (paragraph 3,

last five lines).

Therefore, it would have been obvious to one of ordinary skill in the art at the

time the invention was made to use language model in speech recognition system as

taught by Hiroyuri et al., in Lekutai in view of Mikizo, because that would help calculate

the likelihood of acoustic model for every phonemes (paragraph 99, lines 1 – 5).

4.   Claims 24, and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable

over Lekutai (US PAP 2005/0240391) in view of Mikizo (JP 3-194653).

As per claim 24, Lekutai teaches a speech recognition dictionary creation method for creating a speech recognition dictionary, using a speech recognition dictionary creation device including an abbreviated word generation unit and a vocabulary storage unit, said method comprising: (paragraph 35):

generating, with the use of the use of the abbreviated word generation unit (see example of paragraph 29), an abbreviated word of a recognition object that includes a plurality of constituent words based on a rule that takes into account ease of pronunciation ("enhance readability"; paragraphs 29, and 33, lines 1 - 6); and by concatenating the plurality of constituent words into which the recognition object is divided and which are not adjacent each other, parts of the plurality of constituent words into which the recognition object is divided (paragraph 5, paragraph 29, lines 1 – 6); and

registering, into the speech recognition dictionary, the generated abbreviated word, using the vocabulary storage unit, together with the recognition object ("a memory configured to store an abbreviation library"; paragraph 5).

However, Lekutai does not specifically teach a modifier and a modified word; a word division unit operable to divide the recognition object into the constituent words; and a syllable string generation unit operable to generate syllable strings of each constituent word in the constituent words based on readings of the recognition object, wherein said abbreviated word generating unit is operable to generate the abbreviated word including one ore more syllables by extracting one or more syllables from the syllables strings of the constituent words and concatenating the extracted one or more

syllables based on the syllables strings of the constituent words generated by said

syllables string generation unit.

Mikizo discloses generating and registering a character index as to respective

characters included in data and a phrase index as to a direct phrase consisting of two

continuous characters and an indirect phrase consisting of two characters, which is

combined by abbreviating one or two sandwiched words and which are combined.

Consequently, 'TO GAI', 'GAI GO', and 'GAI DAI' are automatically registered in the

phrase index as the KANJI (Chinese character) abbreviated words of Tokyo Gaikokugo

Daigaku (Mikizo; Abstract).

Therefore, it would have been obvious to one of ordinary skill in the art the time

the invention was made to generate abbreviated words based on syllable strings of the

constituent words as taught by Mikizo in Lekutai, because that would help prevent a

trouble in registration work (Mikizo, Abstract).

As per claim 28, Lekutai in view of Mikizo further disclose a program for a speech

recognition dictionary creation device that creates a speech recognition dictionary, said

program causing a computer to execute the steps included in the speech recognition

creation method according to claim 24 (Lekutai; paragraph 31)

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LEONARD SAINT CYR whose telephone number is (571) 272-4247. The examiner can normally be reached on Mon- Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richemond Dorvil can be reached on (571)272-7602. The fax phone number for the organization where this application or proceeding is assigned is (571)-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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